Bach Nguyen

602-565-5951 | dnguy154@asu.edu | bach-nguyen-05.github.io | linkedin.com/bach | github.com/bach

Education

Arizona State University Tempe, AZ

Bachelor of Science in Computer Science *August 2023 – Expected May 2027*

- GPA: 4.0/4.0
- Specialty: Machine Learning, Artificial Neural Network and Computer Vision

Work Experience

Mathematics Teaching Assistant August 2024 – Present

Arizona State University *Tempe, AZ*

- Assisted in teaching College Algebra and Calculus I in classes of around 100 students by providing one-on-one tutoring, and grading problem sets and assignments
- Facilitated group study sessions based on assessing each student's knowledge, implemented, and presented engaging instructional materials to improve student engagement and enhance their in-class performance

Projects

DeepSeek-R1 Fine-Tune and Benchmark | *Python, Transformers, Unsloth* October 2024 – November 2024

- Fine-tuned DeepSeek-R1 model on a medical reasoning dataset using a virtual machine, achieving over a 0.5% increase in accuracy with a training loss of approximately 1.2
- Leveraged LoRA for efficient training on limited data, optimizing resource usage and utilized 4-bit quantization for loading and saving LM models in gguf format, which can be run locally on Android using llama.cpp
- Implemented various testing methods before employing the biobertscore ("dmis-lab/biobert-v1.1" model) as a benchmarking metric to compare the quality of final answers semantically

Convolutional Neural Network Model | *Python, PyTorch* November 2024 – January 2025

- Applied fundamental knowledge of neural networks to construct a multi-layer architecture with convolutional layers, batch normalization, ReLU activations, and max pooling to efficiently extract and reduce image features
- Developed and implemented a convolutional neural network using PyTorch to classify objects on the CIFAR-10 dataset, achieving 78.5% accuracy and a training loss of approximately 0.4
- Executed data preprocessing and evaluation pipelines and tested various learning rates to determine the optimal training arguments demonstrating practical expertise in model optimization

OpenCV Object Detection and Image Processing | *Python, OpenCV, Numpy* March 2024 – June 2024

- Develop an object detection system using OpenCV and Haas Cascades classifiers to accurately identify faces and vehicles in real time
- Conducted extensive testing and optimization to ensure the reliability of the detection in various environments
- Utilized newly-learned computer vision techniques to determine efficient kernels to enhance performance and accuracy, especially in edge detection

Autonomous Car | *MATLAB, Git/GitHub* September 2023 – December 2023

- Developed an algorithm for a model car in any random map to a designated position using 3 different sensors detecting colors, curve angles, and distances to walls
- Collaborated with three other team members to test and adjust different vectors of values reported by the sensors to improve the accuracy of turning and wall detection
- Utilized linear algebra to encode the given map by constructing matrices to encode wall and path direction aligning with 2^4 possibilities for each small distance the model car has been and checked for feasible ways

Technical Skills

Languages: Java, Python, C/C++, MATLAB, HTML/CSS
Frameworks and Libraries: Pytorch, Transformers (Hugging Face), OpenCV, Tensorflow, Flask, Numpy, Git/GitHub
Relevant Knowledge: Linear Algebra, Probability (Distribution) and Statistics, Linear Regression, Gradient Descent, Transformers, Convolutional, and Feedforward Neural Network